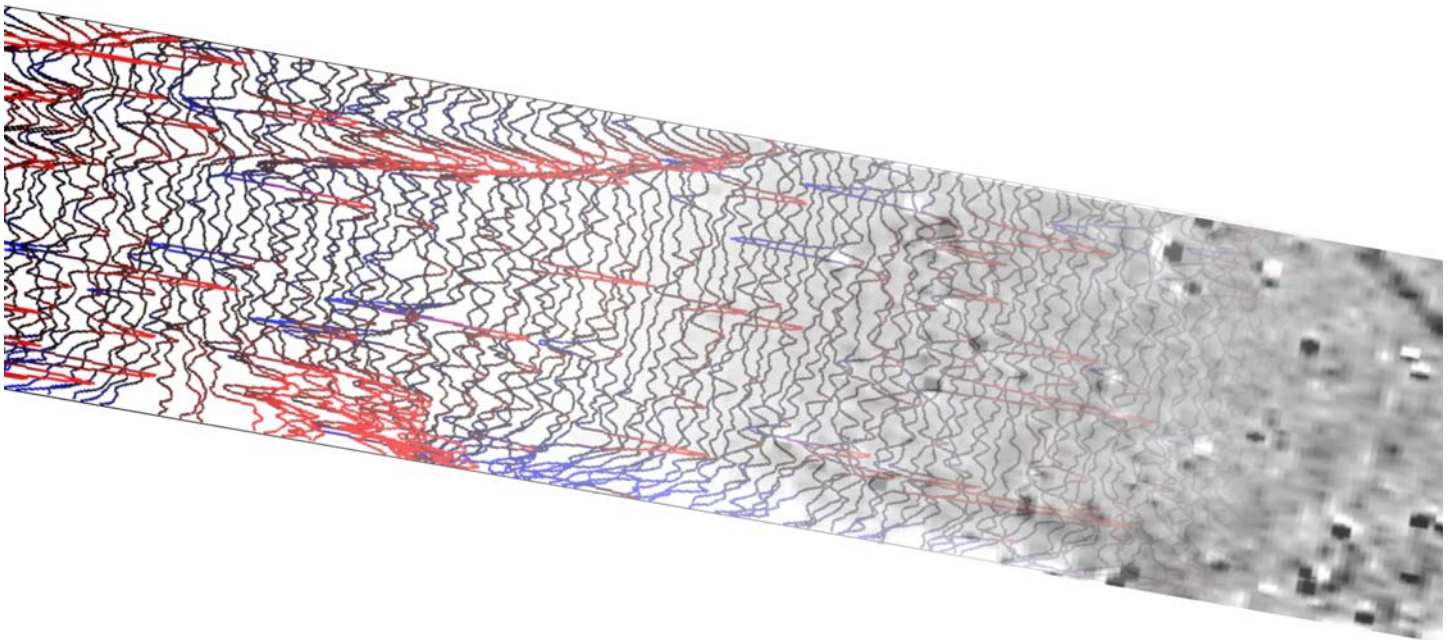




Shrewsbury Resilience Scheme
Wroxeter, Shropshire

Detailed Gradiometer Survey Report





**SHREWSBURY RESILIENCE SCHEME
WROXETER
SHROPSHIRE**

Detailed Gradiometer Survey Report

Prepared for:

Enterprise Managed Services
One Supply Chain West Offices
Lamledge Lane
Shifnal
TF11 8SD

by

Wessex Archaeology
Portway House
Old Sarum Park
Salisbury
SP4 6EB

Ref: 86451.01

January 2013

DISCLAIMER

THE MATERIAL CONTAINED IN THIS REPORT WAS DESIGNED AS AN INTEGRAL PART OF A REPORT TO AN INDIVIDUAL CLIENT AND WAS PREPARED SOLELY FOR THE BENEFIT OF THAT CLIENT. THE MATERIAL CONTAINED IN THIS REPORT DOES NOT NECESSARILY STAND ON ITS OWN AND IS NOT INTENDED TO NOR SHOULD IT BE RELIED UPON BY ANY THIRD PARTY. TO THE FULLEST EXTENT PERMITTED BY LAW WESSEX ARCHAEOLOGY WILL NOT BE LIABLE BY REASON OF BREACH OF CONTRACT NEGLIGENCE OR OTHERWISE FOR ANY LOSS OR DAMAGE (WHETHER DIRECT INDIRECT OR CONSEQUENTIAL) OCCASIONED TO ANY PERSON ACTING OR OMITTING TO ACT OR REFRAINING FROM ACTING IN RELIANCE UPON THE MATERIAL CONTAINED IN THIS REPORT ARISING FROM OR CONNECTED WITH ANY ERROR OR OMISSION IN THE MATERIAL CONTAINED IN THE REPORT. LOSS OR DAMAGE AS REFERRED TO ABOVE SHALL BE DEEMED TO INCLUDE, BUT IS NOT LIMITED TO, ANY LOSS OF PROFITS OR ANTICIPATED PROFITS DAMAGE TO REPUTATION OR GOODWILL LOSS OF BUSINESS OR ANTICIPATED BUSINESS DAMAGES COSTS EXPENSES INCURRED OR PAYABLE TO ANY THIRD PARTY (IN ALL CASES WHETHER DIRECT INDIRECT OR CONSEQUENTIAL) OR ANY OTHER DIRECT INDIRECT OR CONSEQUENTIAL LOSS OR DAMAGE

QUALITY ASSURANCE

SITE CODE	86451	ACCESSION CODE	
PLANNING APPLICATION REF.	N/A	NGR	355875 309300

VERSION	STATUS*	PREPARED BY	APPROVED BY	APPROVER'S SIGNATURE	DATE	FILE
01	E	BCU			02/01/2013	X:\PROJECTS\86451\GEOPHYSICS\REPORT\86451_GEOPHYSICS_REPORT.DOCX

I= Internal Draft E= External Draft F= Final

**SHREWSBURY RESILIENCE SCHEME
WROXETER
SHROPSHIRE**

Detailed Gradiometer Survey Report

CONTENTS

1	INTRODUCTION	1
1.1	Project background	1
1.2	The Site	1
2	METHODOLOGY	2
2.1	Introduction.....	2
2.2	Method	2
3	GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION	3
3.1	Introduction.....	3
3.2	Gradiometer Survey Results and Interpretation.....	3
4	CONCLUSION	6
5	REFERENCES	8
6	APPENDIX 1: SURVEY EQUIPMENT AND DATA PROCESSING.....	9
7	APPENDIX 2: GEOPHYSICAL INTERPRETATION.....	11

FIGURES

Figure 1	Site location plan
Figure 2	Greyscale
Figure 3	XY Trace
Figure 4	Interpretation
Figure 5	Greyscale
Figure 6	XY Trace
Figure 7	Interpretation
Figure 8	Greyscale
Figure 9	XY Trace
Figure 10	Interpretation
Figure 11	Greyscale
Figure 12	XY Trace
Figure 13	Interpretation
Figure 14	Greyscale
Figure 15	XY Trace
Figure 16	Interpretation
Figure 17	Overview interpretation

SHREWSBURY RESILIENCE SCHEME WROXETER SHROPSHIRE

Detailed Gradiometer Survey Report

Summary

A detailed gradiometer survey was conducted over land between Uckington pumping station and Atcham, near Shrewsbury, Shropshire. The project was commissioned by Enterprise Managed Services Ltd. with the aim of establishing the presence, or otherwise, and nature of detectable archaeological features within the survey area. The survey forms part of an ongoing programme of archaeological works ahead of a proposed water main.

The site comprises arable and pasture fields off the B5061 and B4380 from Uckington in the east to Atcham in the west, some 6km southeast of Shrewsbury. The Roman town of Wroxeter lies approximately 1km south of the scheme, which crosses a number of possible archaeological sites identified from aerial photography. These include a number of possible marching camps, a Roman cemetery, a possible barrow and a medieval road. The survey area comprised a 30m wide corridor centred upon the route of the new water main, some 4.2km long. Detailed gradiometer survey was undertaken over all accessible parts of the site, a total of 10.5ha.

The survey has demonstrated the presence of anomalies of definite, probable and possible archaeological interest within the survey area, along with regions of increased magnetic response and several modern services.

Towards the eastern extent of the survey area, a number of linear and pit-like anomalies have been identified within a quiet magnetic background. Between Uckington and Norton, several complexes of archaeological anomalies were noted, including linear ditches corresponding with a former medieval road.

To the west of Norton, several ditch-like anomalies appear in close proximity to a possible Roman marching camp, although the association between the geophysical anomalies and cropmarks has not been proven. Good agreement is seen between the geophysical survey and cropmark evidence to the east of Tern Lodge, where rectilinear ditches and a circular region of increased magnetic response were identified.

To the southwest of Tern Bridge, several anomalies have been identified in close proximity to a possible Roman cemetery and pottery factory, including regions of increased magnetic response and a network of rectilinear ditches.

To the southeast of Atcham, a linear anomaly consistent with a former boundary has been identified, along with a number of anomalies of possible archaeological interest.

Throughout the survey area, numerous weak trends are consistent with ploughing and other agricultural activity. Isolated linear and pit-like anomalies have been identified, although their origins are often unclear.

**SHREWSBURY RESILIENCE SCHEME
WROXETER
SHROPSHIRE**

Detailed Gradiometer Survey Report

Acknowledgements

The detailed gradiometer survey was commissioned by Enterprise Managed Services Ltd. The assistance of Andrew Johnson and Anna Price is gratefully acknowledged in this regard.

The fieldwork was directed by Chris Breeden, Chris Swales and Philip Roberts and assisted by Charlie Hay, Jessica Tibber and Chris Harrison. Ben Urmston processed and interpreted the geophysical data in addition to writing this report. The geophysical work was quality controlled by Dr. Paul Baggaley. Illustrations were prepared by Linda Coleman. The project was managed on behalf of Wessex Archaeology by Richard O'Neill.

SHREWSBURY RESILIENCE SCHEME WROXETER SHROPSHIRE

Detailed Gradiometer Survey Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Enterprise Managed Services Ltd. to carry out a geophysical survey of land between Uckington pumping station and Atcham, near Wroxeter, Shropshire (**Figure 1**), hereafter “the Site” (centred on NGR 355875 309300). The survey forms part of an ongoing programme of archaeological works being undertaken ahead of a proposed water main at the Site.

1.1.2 The aim of the geophysical survey was to establish the presence/absence, extent and character of detectable archaeological remains within the survey area.

1.1.3 This report presents a brief description of the methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data.

1.2 The Site

1.2.1 The survey area comprises a series of arable and pasture fields off the B5061 and B4380 between Uckington in the east and Atcham in the west, passing to the north of Norton. The western extent of the scheme lies some 6km southeast of Shrewsbury, and the eastern extent some 9km south-southeast (**Figure 1**). Detailed gradiometer survey was undertaken along a 30m wide corridor centred upon the proposed route of the new water main, and the accessible parts of the Site amounted to a total of 10.5 ha.

1.2.2 The Site occupies the floodplains of the rivers Tern and Severn, gently undulating around 45m to 50m above Ordnance Datum (aOD) at the western extent, rising relatively steeply to the east of Norton to c. 75m aOD at the eastern extent. The survey areas are generally bordered by arable and pasture land, along with Attingham Deer Park to the northeast of Atcham.

1.2.3 The Site lies approximately 1km north of the Roman town of Wroxeter, or *Viroconium*; this Scheduled Ancient Monument was one of the largest Roman towns in Britain and forms part of an extensive Romano-British landscape (WA 2012). Other monuments are known dating from the Bronze Age, medieval and post-medieval periods.

1.2.4 The solid geology underlying the Site is likely to comprise the sandstones of the Bridgnorth Formation, overlain by clays, silts and gravels (WA 2012). Soils derived from such geological parent material have been shown to produce magnetic contrasts acceptable for the detection of archaeological remains through magnetometer survey. It is possible that increasing thicknesses of alluvial and fluvial deposits exist on the floodplains of the rivers Trent and Severn, which may have the effect of masking weaker magnetic anomalies.

2 METHODOLOGY

2.1 Introduction

- 2.1.1 The detailed magnetometer survey was conducted using a Bartington Grad601-2 dual fluxgate gradiometer system. The survey was conducted in accordance with English Heritage guidelines (2008).
- 2.1.2 The geophysical survey was undertaken by Wessex Archaeology's in-house geophysics team in two phases between 13th November and 13th December 2012. Field conditions at the time of the survey were good, with the survey areas largely being free of obstructions, such as crops.

2.2 Method

- 2.2.1 Individual survey grid nodes were established at 30m x 30m intervals using a Leica Viva RTK GNSS system, which is precise to approximately 0.02m and therefore exceeds English Heritage recommendations (2008).
- 2.2.2 The magnetometer survey was conducted using a Bartington Grad601-2 fluxgate gradiometer instrument, which has a vertical separation of 1m between sensors. Data were collected at 0.25m intervals along transects spaced 1m apart with an effective sensitivity of 0.03nT, in accordance with EH guidelines (2008). Data were collected in the zigzag method.
- 2.2.3 Data from the survey was subject to minimal data correction processes. These comprise a zero mean traverse function ($\pm 5\text{nT}$ thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. These two steps were applied to all survey areas, with no interpolation applied.
- 2.2.4 Further details of the geophysical and survey equipment, methods and processing are described in **Appendix 1**.

3 GEOPHYSICAL SURVEY RESULTS AND INTERPRETATION

3.1 Introduction

- 3.1.1 The gradiometer survey has been successful in identifying anomalies of definite, probable and possible archaeological interest across the Site, along with a number of modern services. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2500 (**Figures 2 to 15**). The data are displayed at -2nT (white) to +3nT (black) for the greyscale image and $\pm 25\text{nT}$ at 25nT per cm for the XY traces.
- 3.1.2 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (**Figures 4 to 16**, overview **Figure 17**). Full definitions of the interpretation terms used in this report are provided in **Appendix 2**. Anomalies are numbered sequentially and discussed from east to west along the route of the proposed water main.
- 3.1.3 Numerous ferrous anomalies are visible throughout the detailed survey dataset. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation.

3.2 Gradiometer Survey Results and Interpretation

- 3.2.1 At the eastern extent of the Site, to the southeast of the Horseshoe Inn in Uckington, several modern services can be seen. Probable services **4000** comprising two parallel linear bands of coherent ferrous responses can be seen close to the southern boundary oriented NE-SW. To the north, more clearly defined pipe-like responses **4001** are aligned NE-SW with a spur leading east. The majority of the survey area here exhibits strong magnetic disturbance associated with the services and car park immediately to the north.
- 3.2.2 To the north of the Horseshoe Inn, sinuous linear anomaly **4002** is of possible archaeological interest and may represent a ditch or former boundary. Numerous linear trends can be seen on varying orientations nearby, although their origins are unclear.
- 3.2.3 Probable modern service **4003** can be seen in close proximity to a track extending to the NW from Uckington, although it is difficult to determine its course clearly due to the magnetic disturbance associated with the track.
- 3.2.4 Immediately west of the track, ditch **4004** is oriented NW-SE. Several large pit-like responses are apparent immediately to the east, although no relationship can be determined between these anomalies. Faint ploughing trends oriented NE-SW are visible to the west of **4004**.
- 3.2.5 Further to the west, linear trends **4005** are visible within a region of quiet magnetic background. It is likely that these are agricultural in origin. To the west of this, strong magnetic disturbance can be seen to the north of the garage on the B5061.
- 3.2.6 A network of faint linear anomalies **4006** is visible to the west of the garage; the individual elements are aligned approximately orthogonally on NW-SE and NE-SW orientations. Immediately to the west of **4006**, amorphous responses **4007** are somewhat stronger and more clearly defined than the linear anomalies.
- 3.2.7 Linear anomaly **4008** lies a short distance to the west of **4007** and it is possible that it is associated, given its similarity in response. Given their

density, it is possible that these three clusters of anomalies are of probable archaeological interest when **4006** to **4008** are considered together.

- 3.2.8 Immediately west of the field boundary, ditch **4009** extends NW-SE across the survey area. A small sub-annular anomaly appears to the north, although it does not exhibit strong contrast with the magnetic background.
- 3.2.9 Linear anomalies **4010** and **4011**, oriented ENE-WSW, are consistent with roadside ditches, and coincide with the location of a medieval road noted at this location (WA 2012, **WA37**). A number of anomalies can be seen between **4010** and **4011**, although it is not clear whether these represent structural elements of the former road.
- 3.2.10 Linear anomaly **4012** is oriented WNW-ESE, parallel with the B5061 to the south; as its origins are unclear, **4012** is considered to be of possible archaeological interest.
- 3.2.11 Linear anomalies **4013**, oriented NW-SE, are consistent with the remnants of ridge and furrow, or possible former boundaries; other ploughing trends aligned perpendicular to this suggest numerous phases of agriculture. It is possible that these anomalies represent parts of the field systems thought to exist to the north of Norton (WA 2012, **WA68**).
- 3.2.12 To the northeast of Norton, linear ploughing trends are oriented on the same NE-SW as near **4013**, although few strong anomalies consistent with former boundaries or headlands can be seen.
- 3.2.13 Immediately to the east of the B4394, a cluster of pit-like anomalies **4014** is visible; some of these are well defined, although their origins are unclear. Two amorphous anomalies **4015** are strongly magnetised, although they do not appear to be ferrous in nature; given their character, they have been interpreted tentatively as being geological in origin.
- 3.2.14 Strong magnetic disturbance can be seen to the west of the B4394 and around Norton Drive; bands of increased magnetic response **4016** and **4017** seem to be associated with the track. Modern service **4018** is oriented NW-SE, parallel with the track.
- 3.2.15 A loose cluster of pit-like anomalies **4019** surrounds a linear anomaly aligned ENE-WSW, although little coherency can be seen to their distribution. To the west of **4019**, ploughing trends can be seen fading into a region of quiet magnetic background.
- 3.2.16 To the west of Norton, curvilinear ditch **4020** extends approximately NE-SW into the survey area; it apparently turns to the east although its response is interrupted by ferrous anomalies; it is possible to trace it for some distance as a magnetic trend, however. Near where **4020** exits the southern boundary of the survey area, a cluster of relatively large pit-like anomalies is visible. Immediately to the west of **4020**, a rectilinear ditch-like anomaly can be seen; it shows little contrast with the magnetic background, however.
- 3.2.17 Linear ditch-like anomaly **4021** does not contrast strongly with the magnetic background and its response appears to be broken in a number of places; given its coincidence with the possible extents of a Roman marching camp (WA 2012, **WA16**), it has been interpreted as being of probable archaeological interest.
- 3.2.18 A cluster of linear and amorphous anomalies **4022** is poorly defined and little coherency can be seen to its distribution; given the density of anomalies, it

- has been interpreted as being of possible archaeological interest. Immediately west of **4022**, a band of magnetic disturbance is oriented NW-SE and is consistent with the remnants of a former field boundary or track. To the east of Attingham Park, the magnetic background is relatively quiet, interspersed with isolated pit-like anomalies and faint linear trends (**4023**).
- 3.2.19 To the east of the junction of the B5061 and the B4380, rectilinear ditches **4024** are likely to represent the northwestern corner of an enclosure. Further to the west, a sub-circular region of increased magnetic response **4025** and probable ditch **4026** may be associated with **4024**.
- 3.2.20 To the east of Tern Bridge, the magnetic background is largely quiet, with faint linear trends and pit-like anomalies visible, e.g. **4027** and **4028**; strong magnetic disturbance can be seen around the track leading south to Confluence Cottage. Towards the bank of the river Tern, a region of increased magnetic response **4029** is visible; it is possible that this is geological in origin, given its proximity to the river.
- 3.2.21 To the west of the confluence of the Tern and Severn, two regions of increased magnetic response **4030** and **4031** are coincident with pit-like anomalies. These regions are consistent with changes in the near-surface geology, particularly given their proximity to the rivers and the probability of alluvial deposits here. Further to the southwest, faint rectilinear anomalies **4032** and rectilinear ditches **4033** appear to represent parts of enclosures. Regions of magnetic disturbance to the north and east of **4032** seem to have some coherency to their distribution, although it is difficult to interpret them as being of archaeological origin.
- 3.2.22 To the southeast of Atcham, a cluster of pit-like and amorphous anomalies **4034** lies at the eastern extent of this portion of the survey area. Their origins are difficult to determine and they are considered to be of possible archaeological interest.
- 3.2.23 Long curvilinear anomaly **4035** extends some 350m westwards along the survey area to **4037**, with an apparent break at **4036**. It is possible that this anomaly relates to a former field boundary.
- 3.2.24 Further to the west, the magnetic background is relatively quiet, with several pit-like anomalies and ploughing trends visible (**4038**). The quiet background persists to the west (**4039**).
- 3.2.25 To the southeast of Atcham, a region of increased magnetic response **4040** is coincident with a ploughed-out former boundary. The response is consistent with ceramic debris, perhaps indicating an attempt to consolidate or drain the field surface.
- 3.2.26 A cluster of pit-like responses **4041** is thought to be of possible archaeological interest, although a region of responses of probable geological origin **4042** lies immediately to its west.
- 3.2.27 To the west of a track, a similar region of probable geological responses is interspersed with linear and pit-like anomalies **4043**. It is possible that these relate to aggregations of gravels or alluvial deposits, although they have been interpreted tentatively as being of possible archaeological interest. At the western extent of the survey area, the magnetic background is much quieter, exhibiting a number of weak linear trends **4044**.

4 CONCLUSION

- 4.1.1 The detailed gradiometer survey has been successful in detecting anomalies of definite, probable and possible archaeological interest within the Site, in addition to regions of increased magnetic response and several modern services.
- 4.1.2 Anomalies of archaeological interest are sparsely distributed within the eastern extent of the survey area; a number of linear and pit-like anomalies appear to the northwest of Uckington, although the extents of magnetic disturbance around roads and buildings makes the wider potential hard to assess.
- 4.1.3 Further west, several clusters of anomalies have been identified, including those to the east of Norton corresponding with the medieval road (**4010**, **4011**, WA 2012 **WA37**).
- 4.1.4 Cropmark evidence in the vicinity of Norton suggests numerous field systems and possible enclosures, although the geophysical anomalies appear less dense and more representative of agricultural activity.
- 4.1.5 Wroxeter Marching Camp A (WA 2012, **WA10**), identified from aerial photography to the west of Norton (WA 2012), is not well represented in this geophysical survey. Anomalies **4020** appear to coincide with the transcribed location of the eastern circuit of the camp, and further anomalies **4021** and **4022** may relate to internal features, although the western circuit is not apparent within the magnetic data.
- 4.1.6 Cropmark evidence to the east of Tern Lodge identifies a fragmentary Roman marching camp and possible barrow. Anomalies **4025** and **4026** lie close to the location of the possible barrow (WA 2012, **WA2**) and the diameter of **4026** is similar to that of the cropmark. The marching camp (WA 2012 **WA19**) is thought to exist to the southeast of Tern Lodge; however, it is difficult to identify other anomalies associated with a camp aside from those at **4024** and **4026**.
- 4.1.7 The magnetic background to the south of Tern Bridge is generally quiet, with localised regions of disturbance associated with extant roads. The proposed location of the Roman cemetery and pottery factory (WA 2012 **WA18 & 20**) is coincident with two regions of increased magnetic response (**4030 & 4031**), several pit-like anomalies and linear trends. Individual graves of any period are difficult to detect through geophysical survey, but the regions of increased response may be indicative of funerary activity. Whilst the increasing depth of alluvial overburden may have masked weaker anomalies, it is considered likely that the strong thermoremanent responses associated with pottery kilns would have been detectable.
- 4.1.8 Some 120m to the southwest, rectilinear anomalies **4032** and **4033** appear to form parts of enclosures or other ditch systems. The DBA did not identify any previous archaeological evidence in the immediate vicinity aside from the cemetery and pottery kilns to the northeast.
- 4.1.9 A cropmark representing a rectangular enclosure has been identified 400m south of Tern Bridge (WA 2012, **WA5**); anomalies **4034** lie immediately south of the transcribed cropmark.
- 4.1.10 Linear anomalies **4035** and **4037** are consistent with a former boundary and lie within a field known as Brickiln Meadow. No anomalies consistent with kilns have been identified, however.

-
- 4.1.11 Linear trends at **4039** lie close to cropmarks identified by the DBA (WA 2012, **WA69**), although it is considered likely that such features would present more clearly defined anomalies.
- 4.1.12 It should be noted that small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that more archaeological features may be encountered than have been identified through geophysical survey.
- 4.1.13 The limited width of the survey corridor has made the archaeological interpretation of the geophysical data less certain in places. Good agreement has been observed between the geophysical data and cropmark evidence in some places, with some discrepancies in others.

5 REFERENCES

English Heritage, 2008. *Geophysical Survey in Archaeological Field Evaluation*. Research and Professional Service Guideline No 1, 2nd edition.

Wessex Archaeology, 2012. *Shrewsbury Resilience Scheme: Archaeological Desk-Based Assessment*. Unpublished report 86450.01

6 APPENDIX 1: SURVEY EQUIPMENT AND DATA PROCESSING

Survey Methods and Equipment

The magnetic data for this project was acquired using a Bartington 601-2 dual magnetic gradiometer system. This instrument has two sensor assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. Each sensor contains two fluxgate magnetometers arranged vertically with a 1m separation, and measures the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03nT over a ± 100 nT range, and measurements from each sensor are logged at intervals of 0.25m. All of the data are stored on an integrated data logger for subsequent post-processing and analysis.

Wessex Archaeology undertakes two types of magnetic surveys: scanning and detail. Both types depend upon the establishment of an accurate 20m or 30m site grid, which is achieved using a Leica Viva RTK GNSS instrument and then extended using tapes. The Leica Viva system receives corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by English Heritage (2008) for geophysical surveys.

Scanning surveys consist of recording data at 0.25m intervals along transects spaced 10m apart, acquiring a minimum of 80 data points per transect. Due to the relatively coarse transect interval, scanning surveys should only be expected to detect extended regions of archaeological anomalies, when there is a greater likelihood of distinguishing such responses from the background magnetic field.

The detailed surveys consist of 20m x 20m or 30m x 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type (EH, 2008).

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and

ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by English Heritage (2008) for characterisation surveys.

Post-Processing

The magnetic data collected during the detail survey are downloaded from the Bartington system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

As the scanning data are not as closely distributed as with detailed survey, they are georeferenced using the GPS information and interpolated to highlight similar anomalies in adjacent transects. Directional trends may be removed before interpolation to produce more easily understood images.

Typical data and image processing steps may include:

- Destripe – Applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- Destagger – Shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;
- Despike – Filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data)

Typical displays of the data used during processing and analysis:

- XY Plot – Presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies.
- Greyscale – Presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

7 APPENDIX 2: GEOPHYSICAL INTERPRETATION

The interpretation methodology used by Wessex Archaeology separates the anomalies into two main categories: archaeological and unidentified responses.

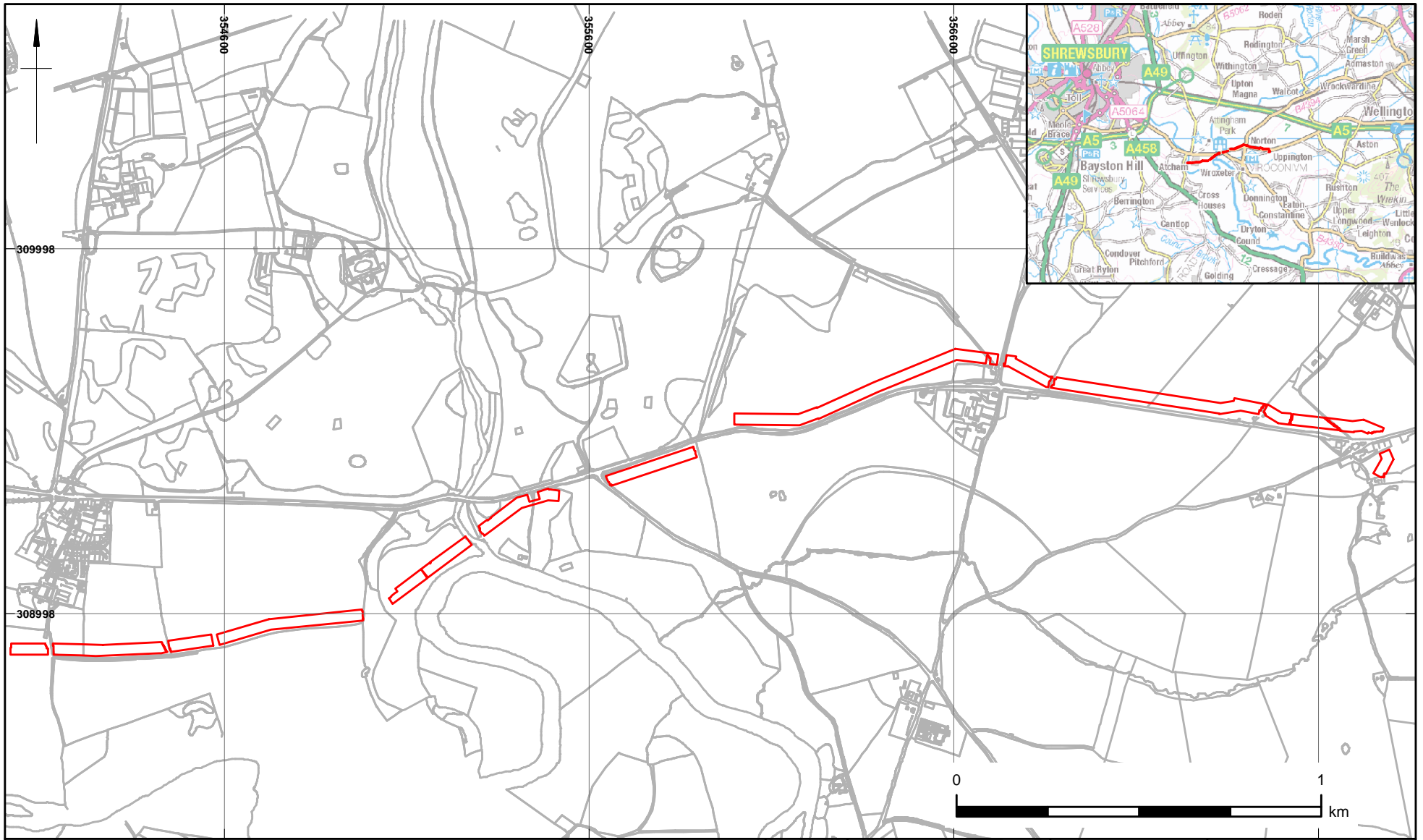
The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- Archaeology – used when there is a clear geophysical response and anthropogenic pattern.
- Probable archaeology – used for features which give a clear response but which form incomplete patterns.
- Possible archaeology – used for features which give a response but which form no discernible pattern or trend.

The unidentified category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- Increased magnetic response – used for areas dominated by indistinct anomalies which may have some archaeological potential.
- Trend – used for low amplitude or indistinct linear anomalies.
- Ferrous – used for responses caused by ferrous material. These anomalies are likely to be of modern origin.

Finally, services such as water pipes are marked where they have been identified.



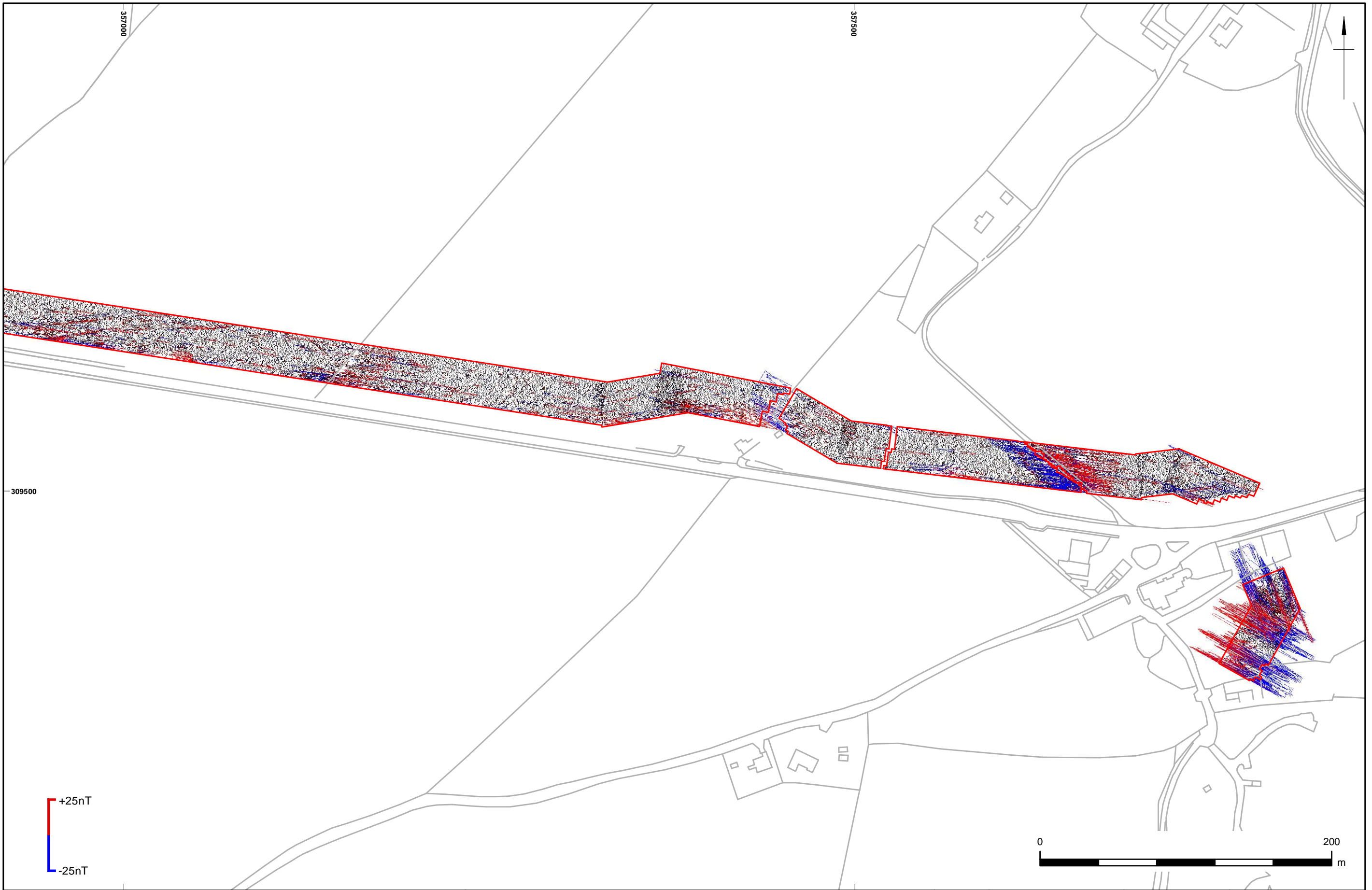
	 Detail Survey Extents	Date:	03/01/13	Revision Number:	0
		Scale:	1:15 000 at A4	Illustrator:	LJC
		Path:	X:\PROJECTS\86451\GIS\FigsMXD		


Site location plan

Figure 1



Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\GreyscaleFigs.mxd		



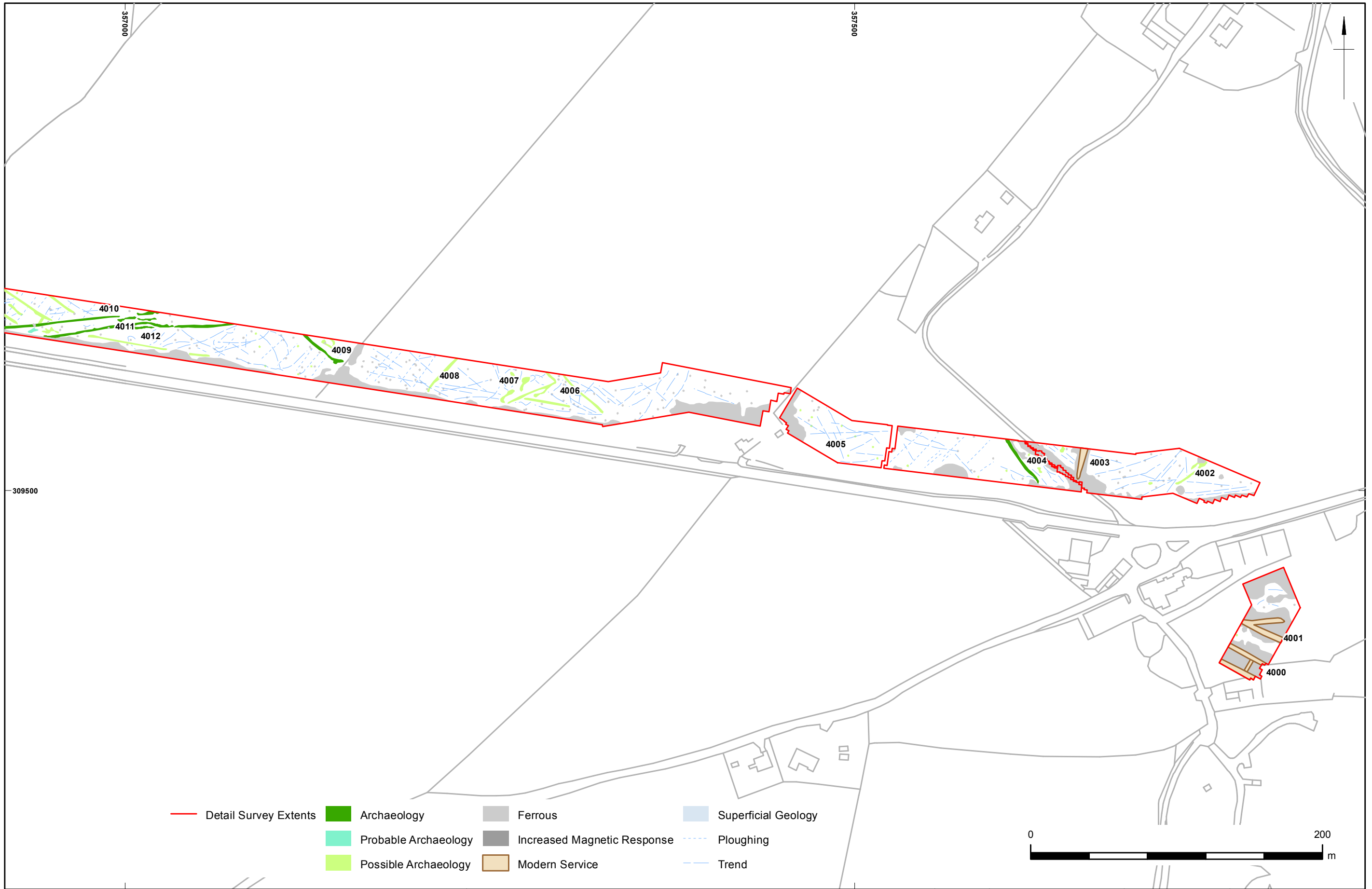

— Detail Survey Extents

Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

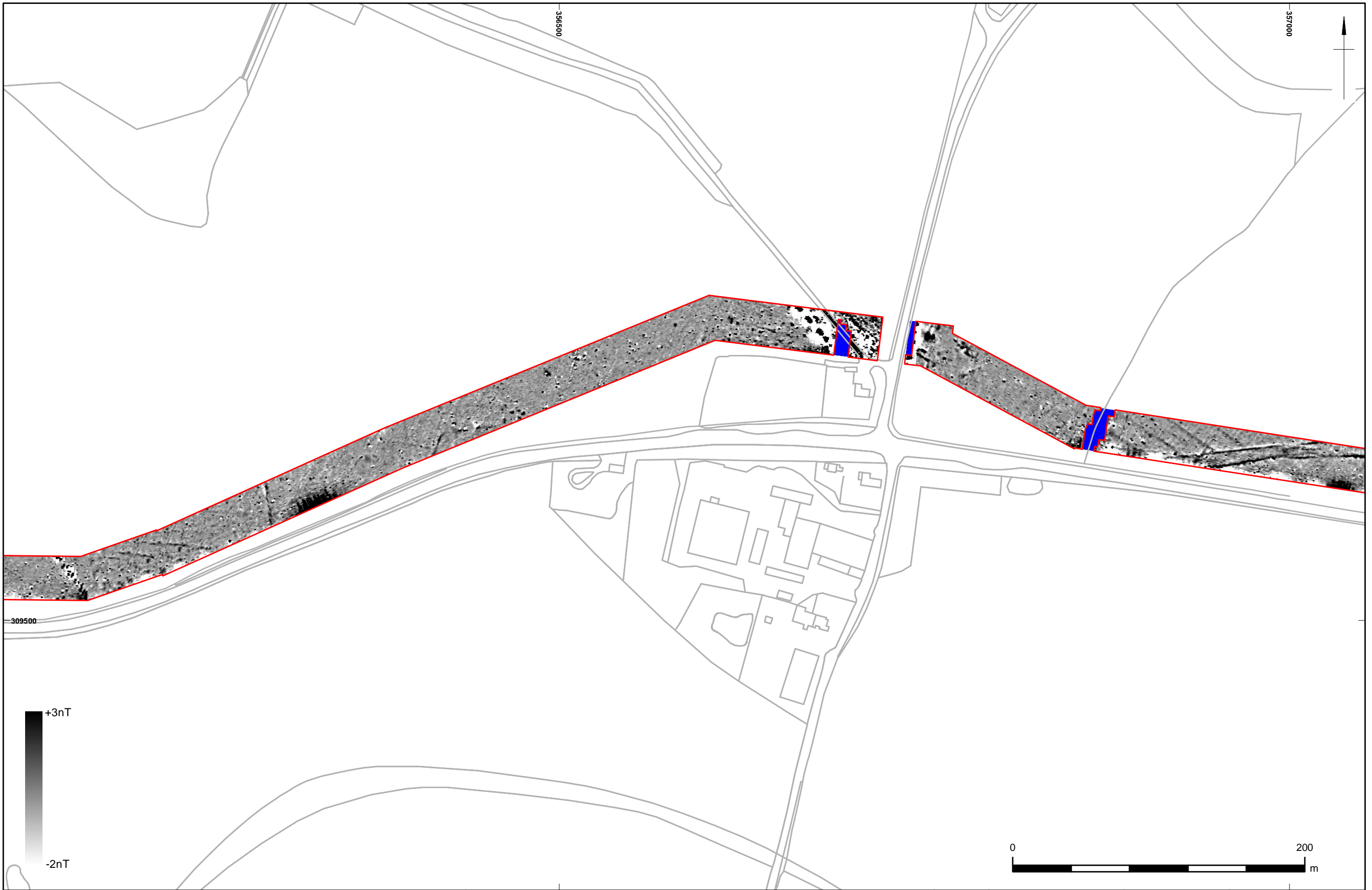
Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\XYFigs.mxd		


XY Trace

Figure 3



Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\InterpFigs.mxd		



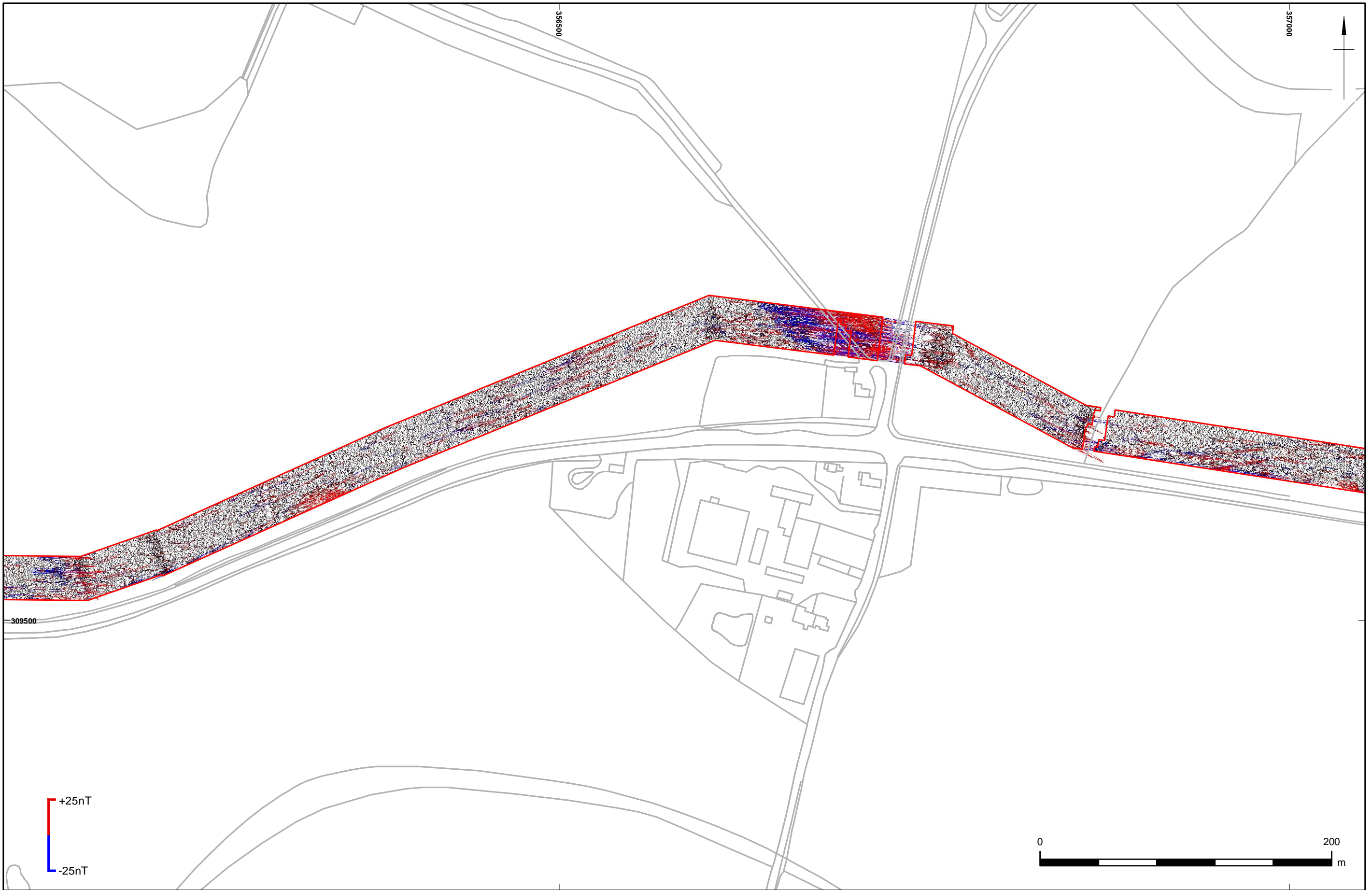

— Detail Survey Extents


Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\GreyscaleFigs.mxd		

Greyscale

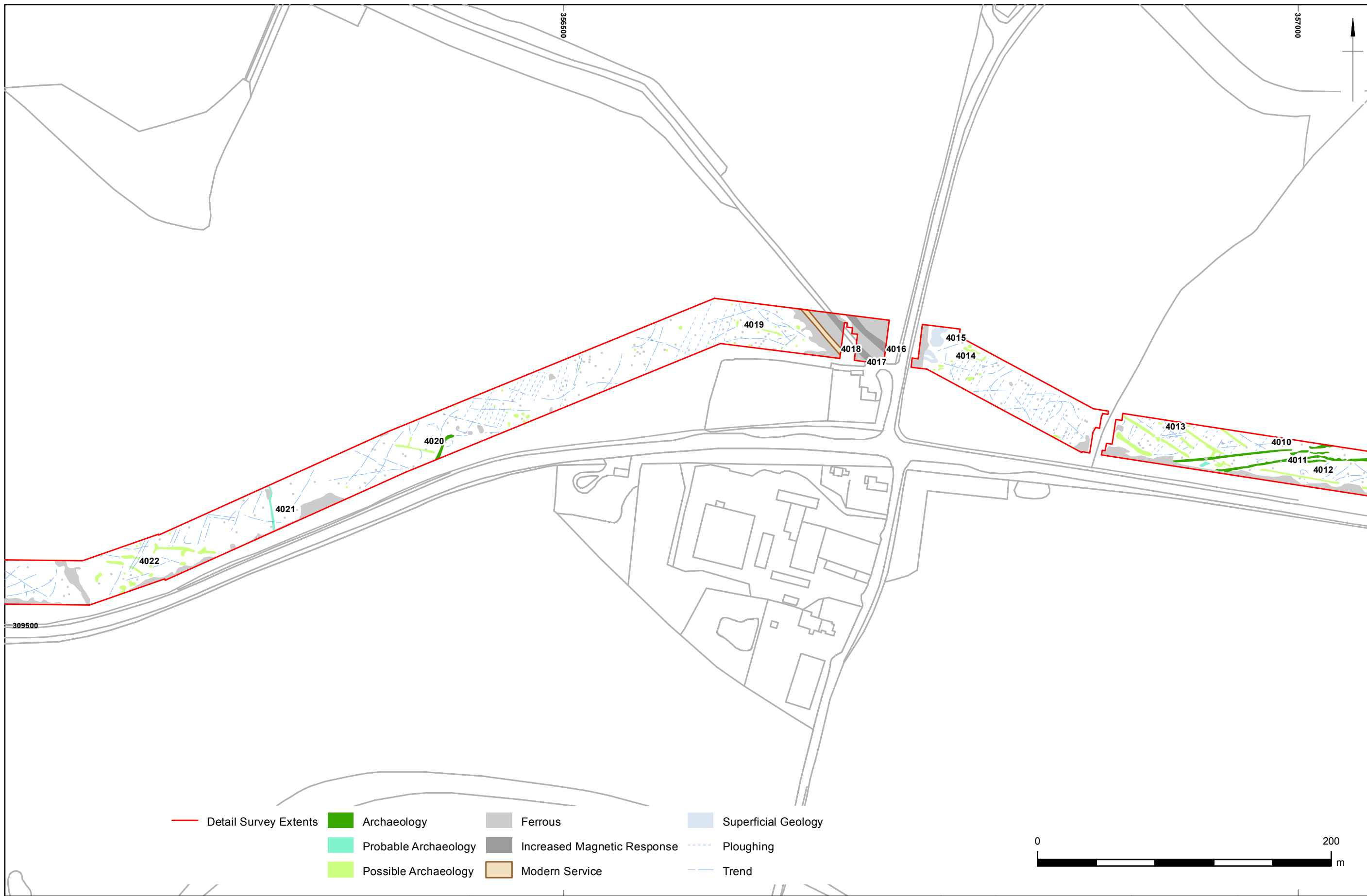
Figure 5



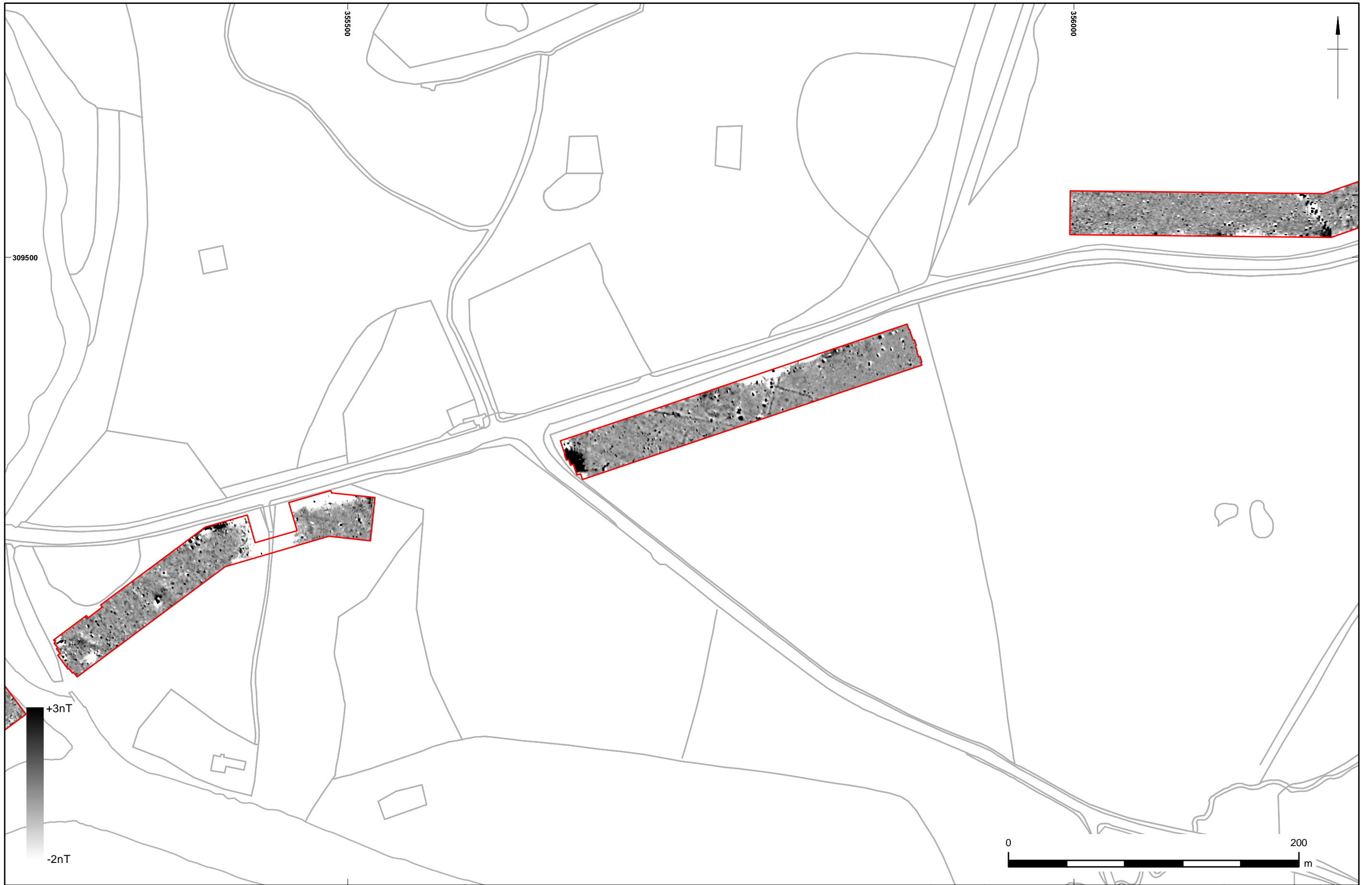

— Detail Survey Extents

Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\XYFigs.mxd		




Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\InterpFigs.mxd		



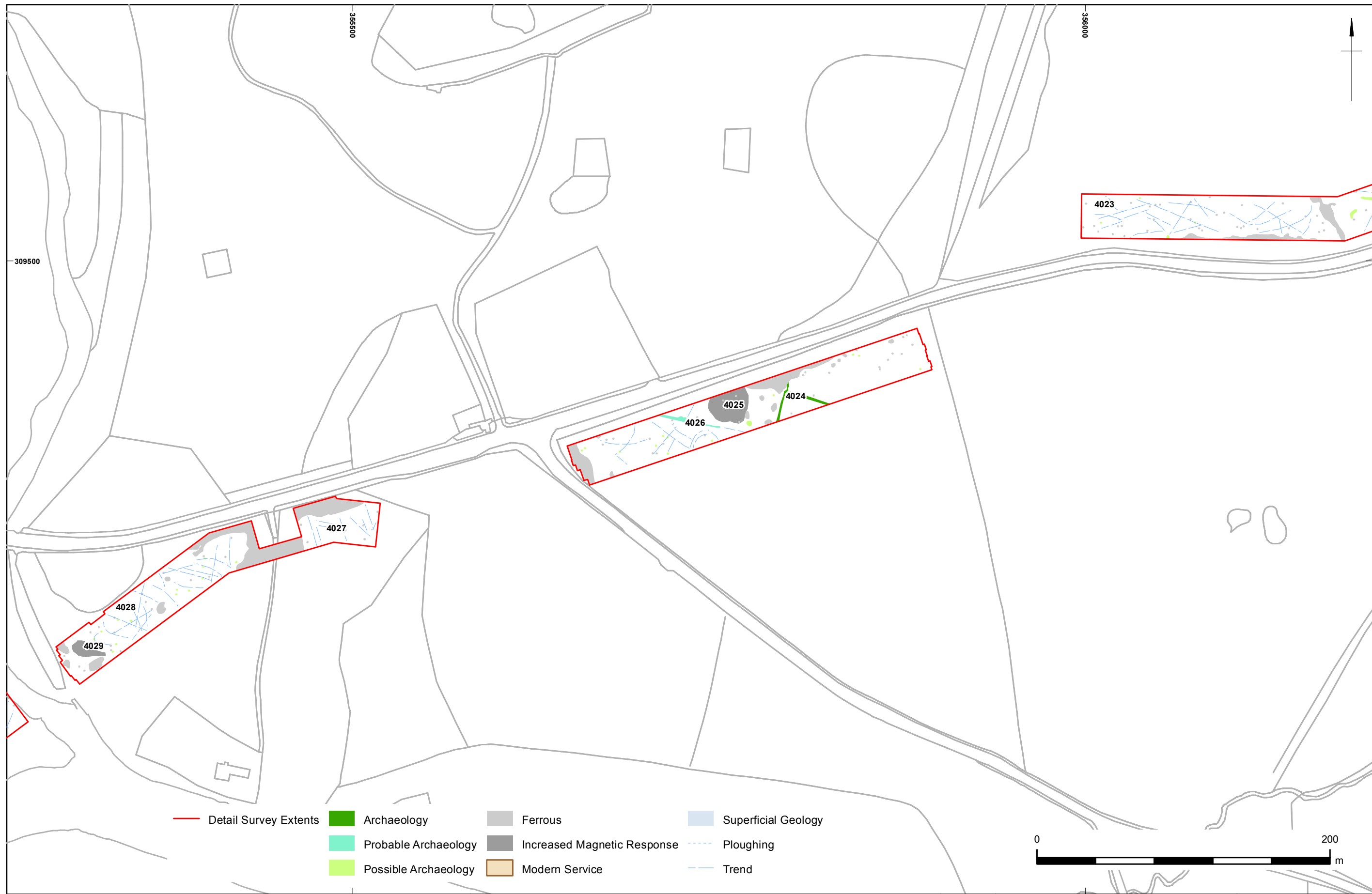
Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\GreyscaleFigs.mxd		




— Detail Survey Extents

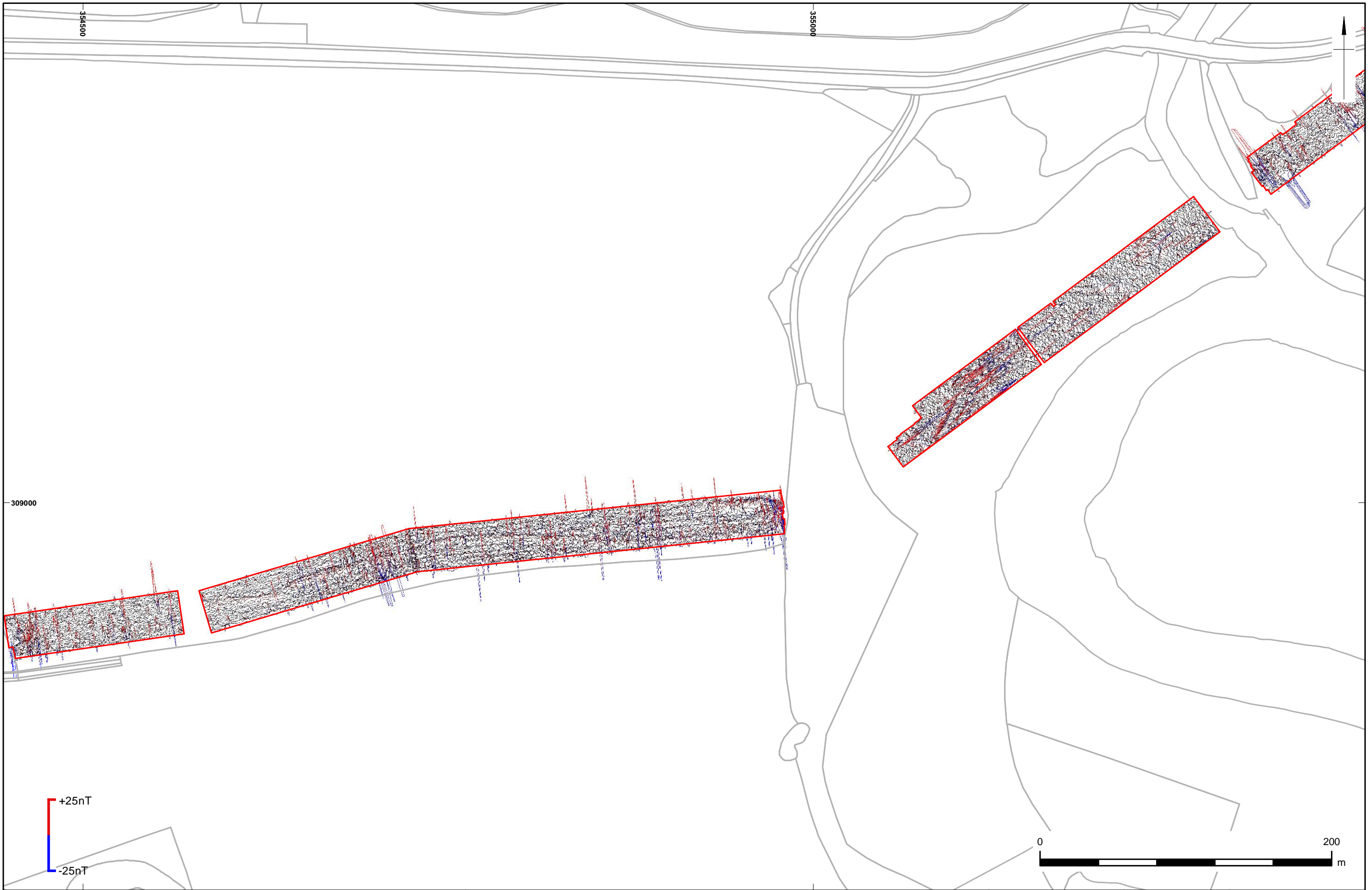
Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.


Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\XYFigs.mxd		





Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\GreyscaleFigs.mxd		




— Detail Survey Extents


Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\XYFigs.mxd		



Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\InterpFigs.mxd		





— Detail Survey Extents

Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

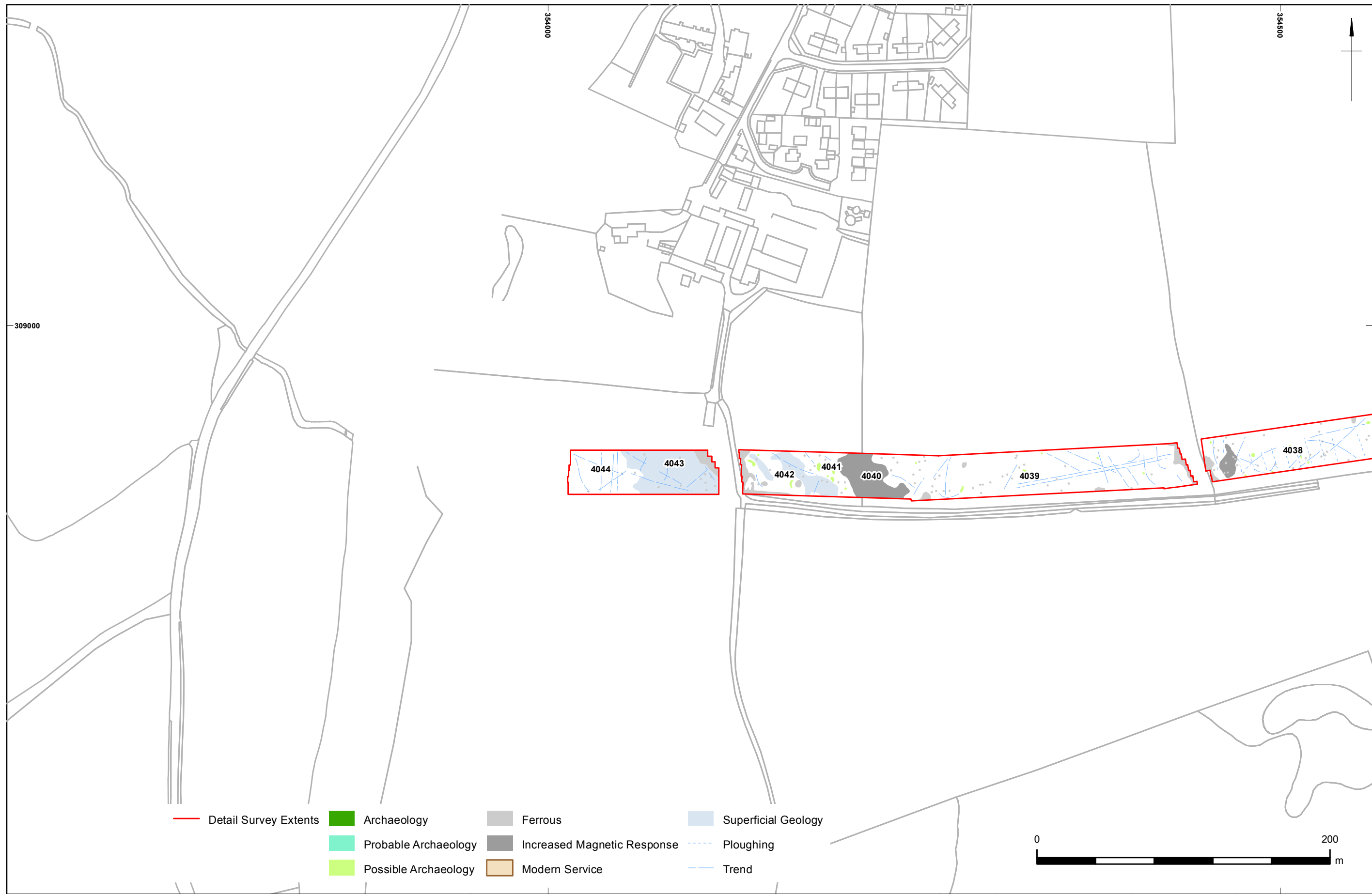
Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\GreyscaleFigs.mxd		



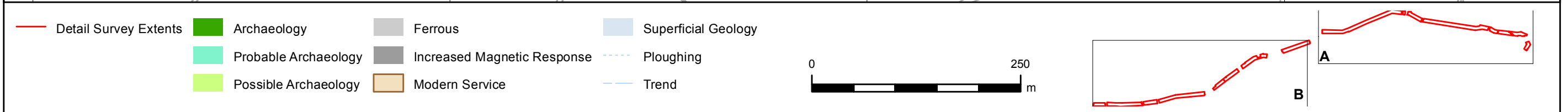
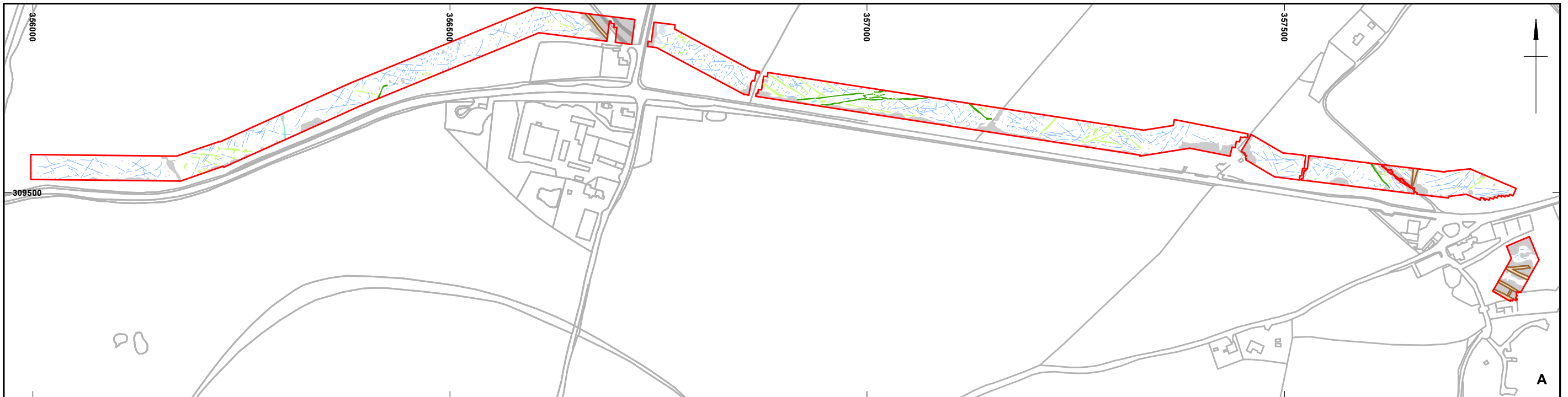

— Detail Survey Extents

Digital data reproduced from Ordnance Survey data © Crown Copyright. Supplied by Severn Trent Water.
 This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\XYFigs.mxd		



Date:	03/01/13	Revision Number:	0
Scale:	1:2500 at A3	Illustrator:	LJC
Path:	X:\PROJECTS\86451\GIS\FigsMXD\InterpFigs.mxd		





WESSEX ARCHAEOLOGY LIMITED.

Registered Head Office: Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB.

Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk

Regional offices in **Edinburgh, Rochester and Sheffield**

For more information visit www.wessexarch.co.uk

